

CLAIMS

1. A method of planning cellular communication networks, including the step of defining at least one cost function (114) to be optimised, said at least one cost function being indicative of the quality of service (QoS) of at least one class of services rendered by the network, characterised in that it includes the step of selecting said at least one class of services as a location-based services rendered by said network.

2. The method of claim 1, characterised in that said cost function indicative of the quality of service of location-based services is based on measuring a dilution of precision (DOP) of said network.

15 3. The method of claim 1, characterised in that it includes the steps of:

- defining a joint cost function jointly indicative of the quality of service (QoS) of location-based services and at least an additional class of services rendered by said network, said additional class of services being selected from the group consisting of voice services and data services, and

- optimising (115) said joint cost function.

4. The method of claim 1, characterised in that it includes the steps of:

- providing a system (4000) for measuring at least one actual network parameter, and

- comparing the measurements provided by said measurement system (4000) with the corresponding parameters as planned.

5. The method of claim 1, characterised in that it includes the step of locating (220) at least one critical point in the network where inadequate quality of service is being provided.

6. The method of claim 5, characterised in that it includes the step of generating (215) information items indicative of counter measures to be carried out in said network in order to dispense with at least one critical 5 point.

7. The method of claim 1, characterised in that said at least one cost function is optimised by using as input data the location of at least one radiating system associated to one base station in said cellular 10 communication network.

8. The method of claim 7, for planning a cellular communication network over a given area, characterised in that it includes the steps of:

- subdividing (111) said area into sub-areas, one of 15 said sub-areas corresponding to the destination sub-area of a new base station in said network, the remaining sub-areas being expected to be affected by the introduction of said the new base station,

- planning (112, 113) said destination sub-area of 20 the new base station also by evaluating the effects on said remaining sub-areas,

- evaluating (115) the quality of service resulting from said planning (112, 113), while ascertaining whether such a level of quality of service is satisfactory.

25 9. The method of claim 8, characterised in that said planning involves computing a point-by-point value of the dilution of precision (DOP) for all the pixels in the area subject to planning.

10. The method of claim 9, characterised in that said 30 planning involves computing a cost function pertaining to location services only, said cost function being a linear combination of said dilution of precision (DOP) and the average and minimum values thereof.

11. The method of claim 8, characterised in that it includes the step of optimising a joint cost function for voice, data and location services.

12. The method of claim 8, characterised in that, if 5 said quality of service is found not to be satisfactory, it includes the step of re-planning the position of at least one radiating system associated to one base station in said cellular network.

13. The method of claim 12, characterised in that 10 said at least one radiating system whose position is re-planned associated to one base station is an radiating system associated to said new base station.

14. The method of claim 4, characterised in that it includes the steps of:

15 - providing a set of network design parameters (200),  
- obtaining from said measurement system (4000) a set 20 of measurements corresponding to said set of design parameters (210),  
- locating (220) at least one critical area wherein the quality of service of said location services fails to reach an expected quality of service level as a result of said set of measurements failing to comply with said set of network design parameters.

16. The method of claim 14, characterised in that it 25 includes the steps of:

- selecting a service scenario (211),  
- selecting at least one location system (212) as the one most affected by the variations in the network parameters being analysed

30 16. The method of claim 14, characterised in that it includes the step of providing at list of points in the network characterised by their quality of service.

17. The method of claim 14, characterised in that it 35 includes the steps of generating and displaying a map of critical points in the area under analysis.

18. The method of claim 1, characterised in that it includes the step of providing a remote deployment module (3000) arranged for operating on a sub-set of the network subject to planning.

5 19. The method of claim 18, characterised in that it includes the steps of configuring said remote deployment module (3000) for collecting local network data (311), pre-validating such measurements (312) and either comparing said measurements with corresponding planning  
10 data of a network design sub-set (310) or sending such measurements to a remote module (2000) for further processing.

20. A cellular communication network including at least one processing module (1000, 2000, 3000, 4000) for  
15 implementing the planning method of any of claims 1 to 19.

21. A computer program product directly loadable in the memory of a computer and including software code portions for performing the steps of the method of any of  
20 the claims 1 to 19 when the product is run on a computer.